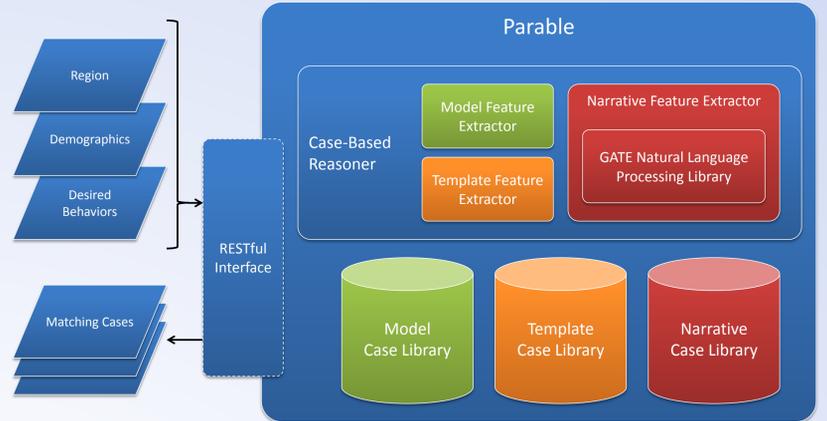
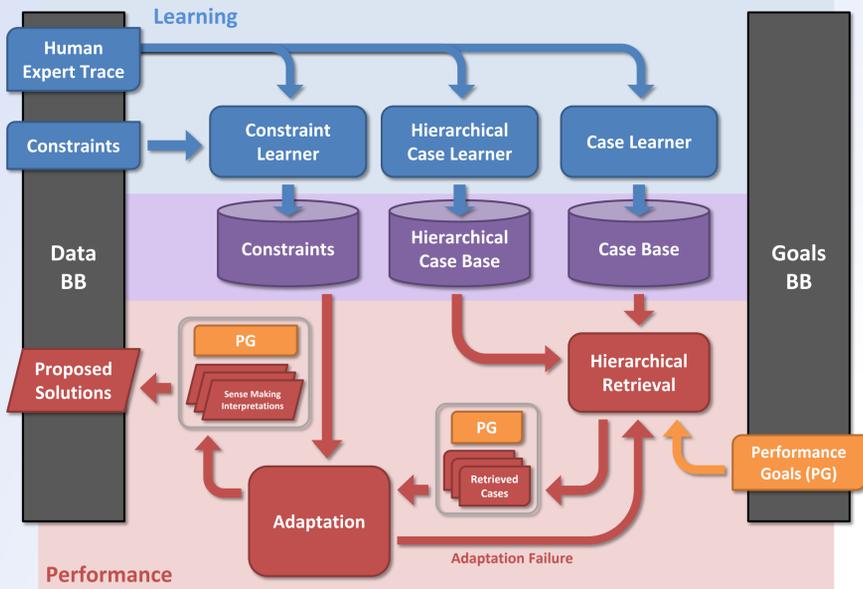


Lead Investigator
Elizabeth T. Whitaker, Ph.D.
 With
Ethan Trehitt

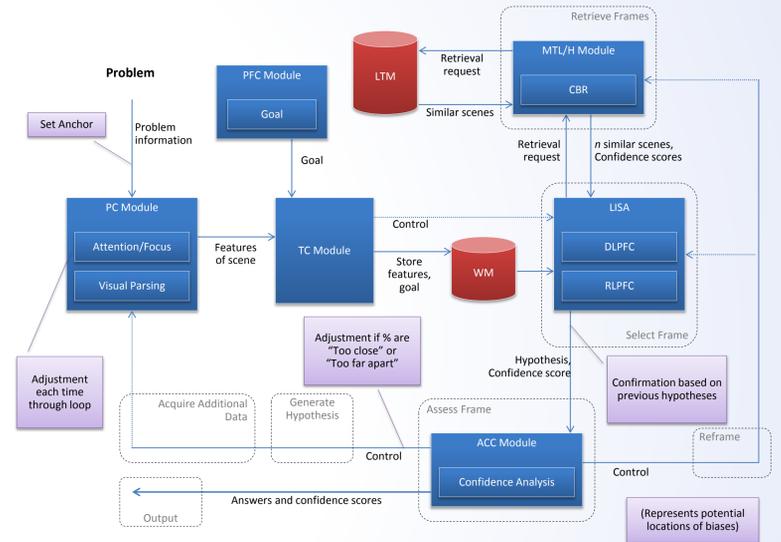
Research Areas of Interest

Qualifications and Capabilities



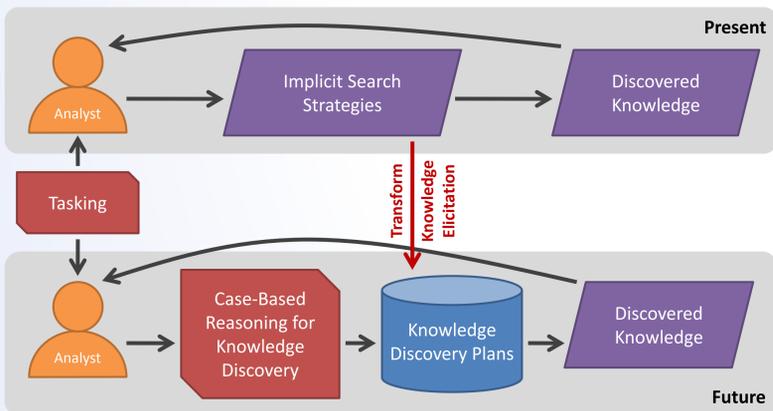
DARPA Narrative Networks

Our team is using fMRI analysis to explore human responses to narratives with particular characteristics. Recently, an alternative to traditional statistical thresholding methods for functional magnetic resonance imaging (fMRI) has been developed. This technique, known as multi-voxel pattern analysis (MVPA) uses pattern classification algorithms to determine sub-threshold activation patterns in fMRI data. We designed a narrative composition prototype using case-based reasoning, learning and planning augmented by heuristics to provide domain knowledge, constraints and adaptation capabilities.



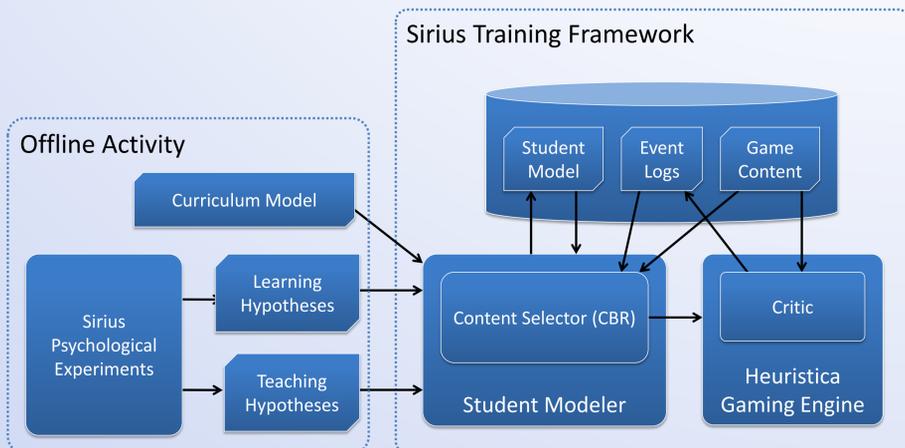
DARPA Integrated Learning Project

GTRI collaborated with a large team of researchers on the DARPA Integrated Learning project, which had as its goal to research the integration of multiple machine learning paradigms to learn to solve a problem by observing an expert in a single problem-solving session. GTRI, collaborating with the Georgia Tech College of Computing, developed a case-based learner & reasoner to perform as part of the integrated learning activity.



Case-based Reasoning for Knowledge Discovery

GTRI investigated analytic strategies used in the process of discovering new knowledge, as part of the ARDA/DTO Novel Intelligence from Massive Data (NIMD) program. We designed and prototyped a software tool for intelligence analysts that uses case-based reasoning and case-based planning to plan and execute complex interdependent Internet searches to aid analysts in discovering information relevant to a tasking. Our case-based reasoning approach represents best-practice analytic strategies in the form of domain specific search plans which are stored in a case library. The prototype matches an analyst's current problem with the most similar problem in the case library and adapts the associated search plan to solve the current problem.

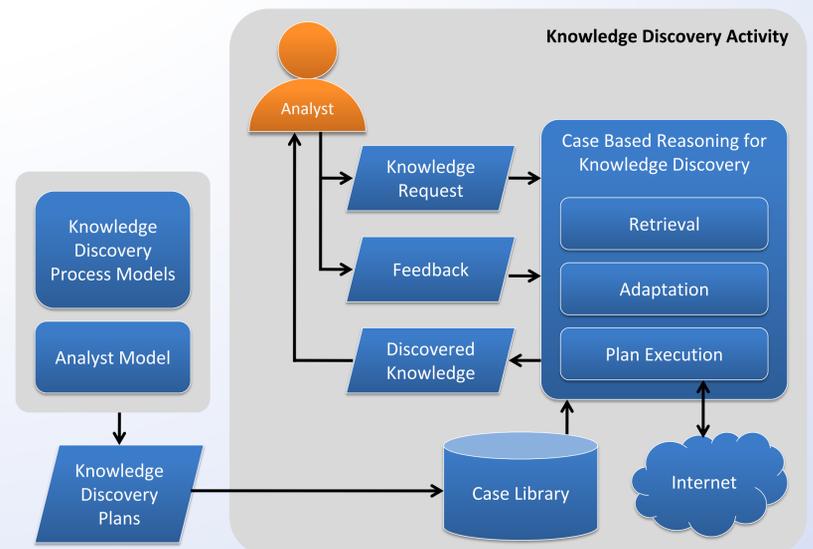


IARPA SIRIUS

GTRI collaborated with Applied Research Associates on the Heuristica serious game, which was a research project aimed at training users to recognize and avoid their cognitive biases when performing analytical decision making tasks. GTRI supplied a student model and content selector capabilities to personalize and adapt gameplay and maximize the learning potential of each student.

IARPA ICARUS

The objective of the ICARUS Program is to construct brain-based computational models of the process known as sensemaking. Sensemaking, a core human cognitive ability, underlies intelligence analysts' ability to recognize and explain relationships among sparse and ambiguous data. The GTRI team was part of a larger project team and contributed component models and neuroscience domain knowledge from the School of Psychology



Case-Based Reasoning for Knowledge Discovery (CBR for KD) Capabilities Cases

- Does the organization possess the technical capabilities?
- Does the organization have access to the raw materials?
- What manufacturing resources are available?
- Who are the experts in this area?
- Who have the experts collaborated with and what are their capabilities?
- What publications and education exist in this area?

The GTRI team will provide tools to support structured reasoning techniques that make use of evidence streams from crowdsourcing using case-based reasoning and Bayes nets. We will provide cognitive reasoning for integration of related contextual information.

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